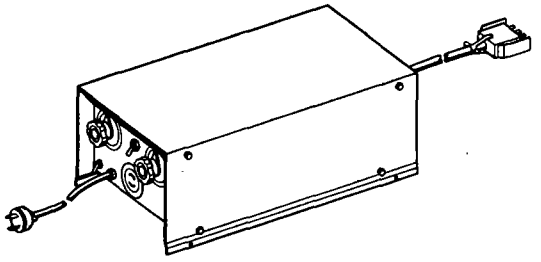
June 1977 FORM: OM-1083A

Effective With Serial No. HE755109

MODEL	STOCK NO.
Millermatic Spot Weld Control	
CS-1A	058 166



MODEL/STOCK NO.	SERIAL/STYLE NO.	DATE PURCHASED

OWNER'S MANUAL

millerMatic®

MILLER ELECTRIC MFG. CO.
APPLETON, WISCONSIN, USA 54911

ADDITIONAL COPY
PRICE 30 CENTS

NWSA CODE NO. 4579

PRINTED IN U.S.A.

LIMITED WARRANTY

EFFECTIVE: NOVEMBER 1, 1976

This warranty supersedes all previous MILLER warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY—Miller Electric Mfg. Co., Appleton, Wisconsin warrants to Customer that all new and unused Equipment furnished by Miller is free from defect in workmanship and material as of the time and place of delivery by Miller. No warranty is made by Miller with respect to engines, trade accessories or other items manufactured by others. Such engines, trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any. At the present time, the manufacturer's warranty on the Mag-Diesel engine on DEL-200 is limited to six months and on all other engines to one year.

MILLER warranty does not apply to components having normal useful life of less than one (1) year, such as spot welder tips, relay and contactor points, MILLERMATIC parts that come in contact with the welding wire including nozzles and nozzle insulators where failure does not result from defect in workmanship or material.

In the case of Miller's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefor shall be, at Miller's option, (1) repair or (2) replacement or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at Customer's risk and expense. Upon receipt of notice of apparent defect or failure, Miller shall instruct the claimant on the warranty claim procedures to be followed.

As a matter of general policy only, Miller may honor an original user's warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Arc welders, power sources, and components ... 1 year
2. Original main power rectifiers ..... 3 years
   (Labor — 1 year only)
3. All welding guns and feeder/guns ..... 90 days
4. All other Millermatic Feeders ..... 1 year

provided that the user so notifies Miller in writing within thirty (30) days of the date of such failure.

5. Replacement or repair parts exclusive of labor .. 60 days

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

EXCEPT AS EXPRESSLY PROVIDED BY MILLER IN WRITING, MILLER PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND *NOT* FOR CONSUMERS OR CONSUMER USE. MILLER' WARRANTIES DO NOT EXTEND TO, AND NO RESELLER IS AUTHORIZED TO EXTEND MILLER'S WARRANTIES TO, ANY CONSUMER.

SECTION 1 - INTRODUCTION

1-1. GENERAL

This manual has been prepared especially for use in familiarizing personnel with the design, installation, operation, maintenance, and troubleshooting of this equipment. All information presented herein should be given careful consideration to assure optimum performance of this equipment.

1-2. RECEIVING-HANDLING

Prior to installing this equipment, clean all packing material from around the unit and carefully inspect for any damage that may have occurred during shipment. Any claims for loss or damage that may have occurred in transit must be filed by the purchaser with the carrier. A copy of the bill of lading and freight bill will be furnished by the carrier on request if occasion to file claim arises.

When requesting information concerning this equipment, it is essential that Model Description and/or Stock Number and Serial (or Style) Numbers of the equipment be supplied.

1-3. DESCRIPTION

This control unit is designed to add spot welding capability to the control/feeder. When installed, this unit will provide at its control panel the selection of either continuous or spot welding capability without having to change any interconnecting wiring between the welding power source, the control/feeder, the control unit, or the gun. Mode change is achieved by positioning the CONTINUOUS-SPOT Switch on the front of the control unit. When in the CONTINUOUS position, the control units controls are shunted out of the gun circuit, thereby providing weld control through the control/feeder as before. However, when in the SPOT position, the control unit will provide electronically timed spot welding with the gun.

The unit is designed to mount atop of the control/feeder, with interconnections to the gun and control/feeder simplified by use of prewired receptacles, plugs and cables.

1-4. SAFETY

The following definitions apply to CAUTION, IMPORTANT, and NOTE blocks found throughout this manual:

CAUTION

Under this heading, installation, operating, and maintenance procedures or practices will be found that if not carefully followed may create a hazard to personnel.

IMPORTANT

Under this heading, installation, operating, and maintenance procedures or practices will be found that if not carefully followed may result in damage to equipment.

NOTE

Under this heading, explanatory statements will be found that need special emphasis to obtain the most efficient operation of the equipment.

SECTION 2 - INSTALLATION

NOTE

Follow installation procedures as numbered by steps in Figure 2-1.

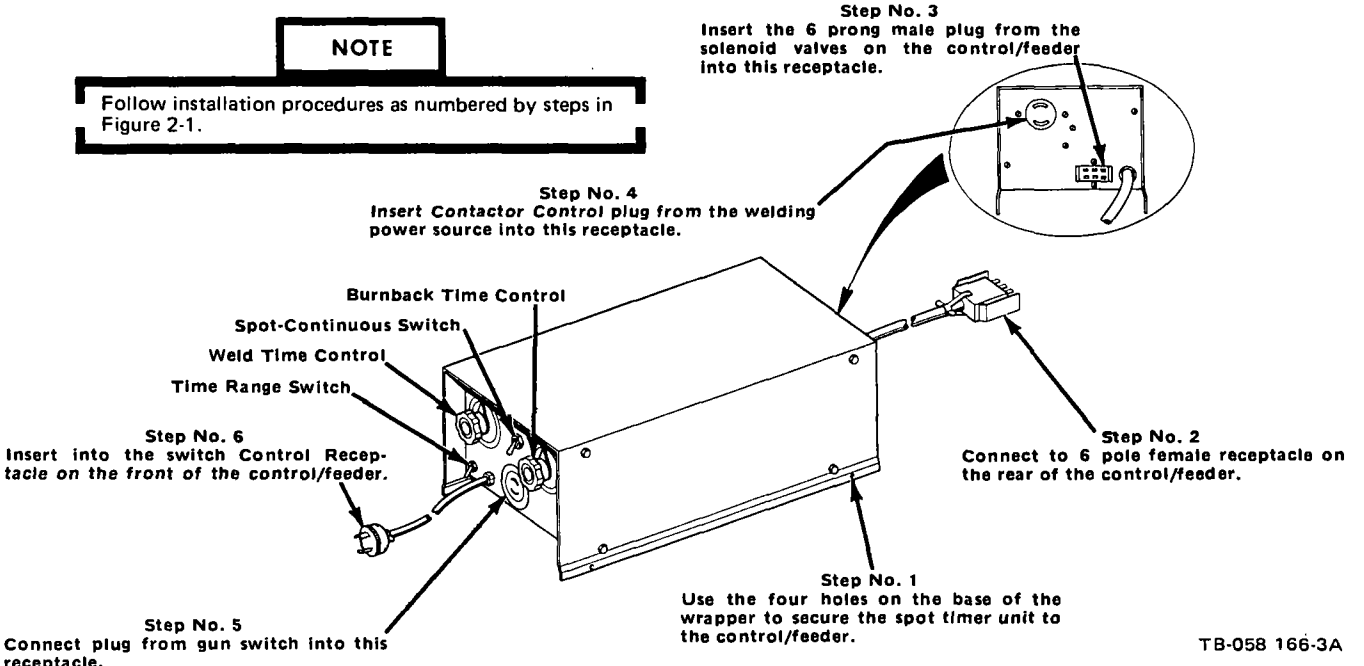

Step No. 3
Insert the 6 prong male plug from the solenoid valves on the control/feeder into this receptacle.
Step No. 4
Insert Contactor Control plug from the welding power source into this receptacle.
Burnback Time Control
Spot-Continuous Switch
Weld Time Control
Time Range Switch
Step No. 6
Insert into the switch Control Receptacle on the front of the control/feeder.
Step No. 2
Connect to 6 pole female receptacle on the rear of the control/feeder.
Step No. 1
Use the four holes on the base of the wrapper to secure the spot timer unit to the control/feeder.
Step No. 5
Connect plug from gun switch into this receptacle.
TB-058 166-3A

Figure 2-1. Installation Of The Control Unit

NOTE

If the control unit is to be installed on a model 10E or 30E control/feeder, an adapter kit will have to be purchased in order to connect the control unit to the control/feeder. Follow the installation instructions supplied with the adapter kit when installing the control unit on a model 10E or 30E control/feeder.

SECTION 3 - FUNCTION OF CONTROLS

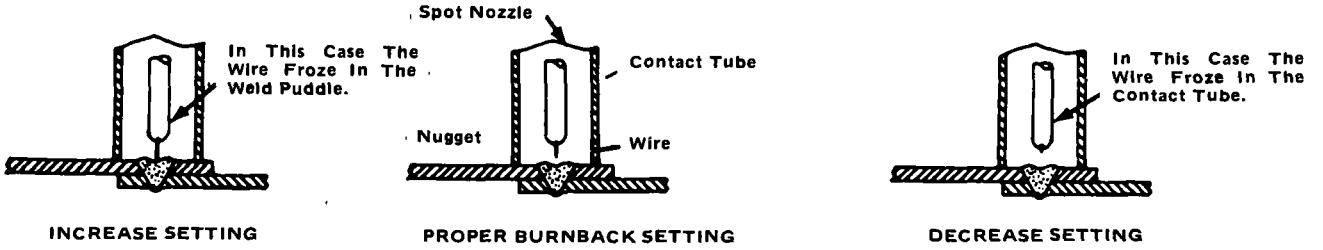


Figure 3-1. Burnback Settings

3-1. SPOT-CONTINUOUS SWITCH (Figure 2-1)

The purpose of the SPOT-CONTINUOUS Switch is to provide the capability of selecting either normal wire feed operation or a timed weld operation. Placing the SPOT-CONTINUOUS Switch in the SPOT position will provide a timed weld as determined by the TIME RANGE Switch and the WELD TIME Control. Placing the SPOT-CONTINUOUS Switch in the CONTINUOUS position will cause the control/feeder to operate normally.

3-2. TIME RANGE SWITCH (Figure 2-1)

Through use of the TIME RANGE Switch two spot weld time ranges can be obtained. Placing the TIME RANGE Switch in the upper position will provide a time range of .2 to 2.5 seconds. Placing the TIME RANGE Switch in the lower position will provide a time range of 2.5 to 5 seconds. Exact time selection within the course range chosen can be made by the WELD TIME Control.

3-3. WELD TIME CONTROL (Figure 2-1)

The WELD TIME Control provides the capability of being able to select the desired spot weld time within the range selected.

3-4. BURNBACK TIME CONTROL (Figure 2-1)

The BURNBACK TIME Control provides a means of varying the amount of time that weld current will be allowed to remain on the electrode wire after the electrode wire has stopped feeding. By keeping weld current present on the electrode wire, the electrode wire will burn away from the workpiece and toward the contact tube. An ideal BURNBACK TIME Control setting is one where the electrode wire neither sticks to the workpiece or burns back into the contact tube.

If the electrode wire sticks to the workpiece, the BURNBACK TIME Control setting should be increased.

If the electrode wire burns back into the contact tube, the BURNBACK TIME Control setting should be decreased.

SECTION 4 - SEQUENCE OF OPERATION

1. Re-check to assure proper connections have been made in accordance with Section 2 - Installation, of this manual.
2. Turn on power to power source and control/feeder.
3. Position SPOT-CONTINUOUS Switch to desired position. If in CONTINUOUS position weld as before. If SPOT mode is selected, proceed as outlined in steps below.
4. Position TIME RANGE Switch to appropriate time range desired.
5. Adjust WELD TIME Control to setting desired within time range selected by TIME RANGE Switch.
6. Adjust BURNBACK TIME Control to proper burnback setting.
7. Position gun on workpiece and commence spot welding.

NOTE

Once the WELD TIME control becomes functional, the gun switch must not be released until the completion of the spot weld application. Should the gun switch be released before the completion of the WELD TIME cycle, the gun switch will have to be reactivated to complete the weld.

SECTION 5 - TROUBLESHOOTING

CAUTION

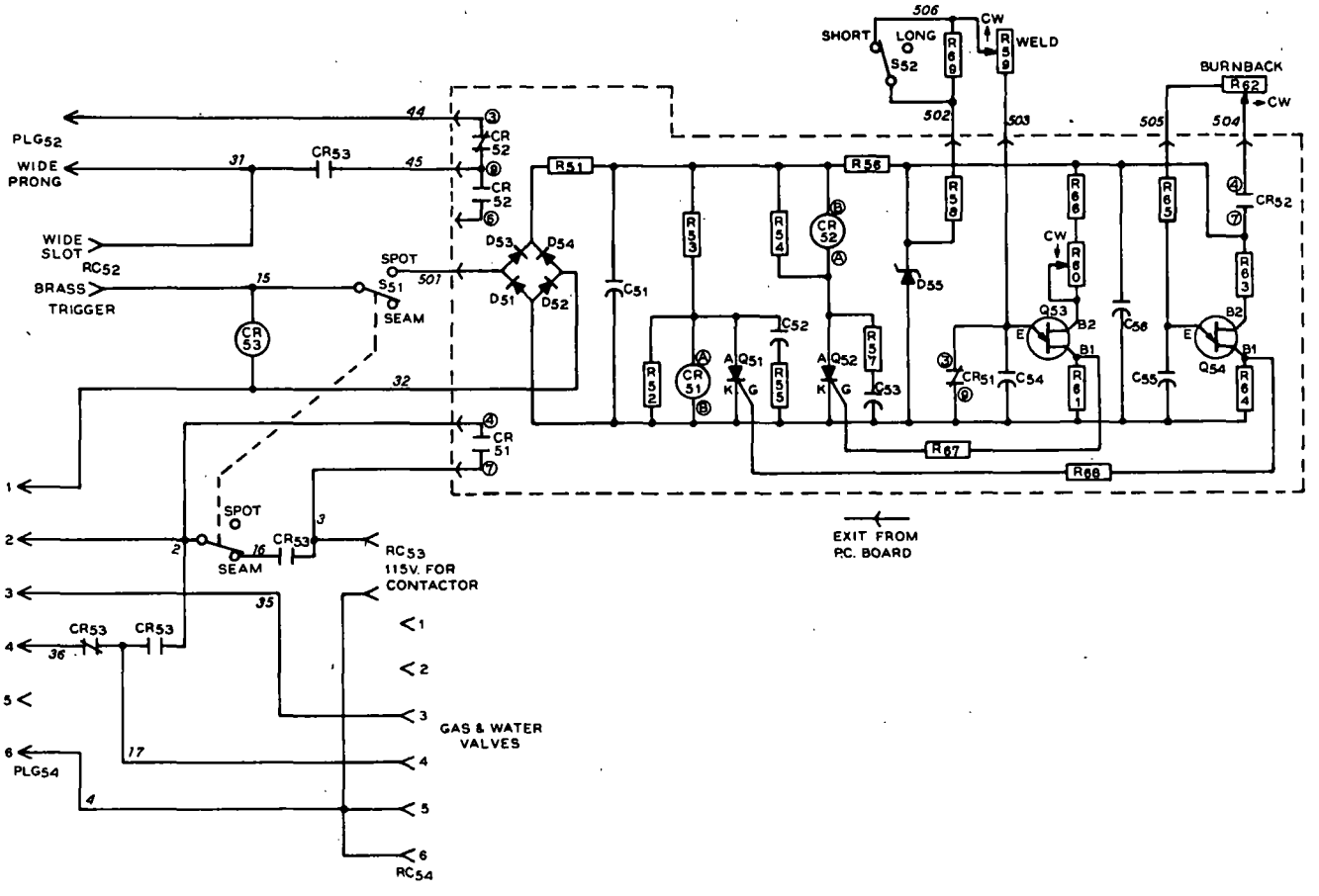
Hazardous voltages are present on the internal circuitry of the control unit as long as power is connected to the unit. Disconnect power before attempting any inspection or work on the inside of the unit. Troubleshooting of internal circuitry should be performed by qualified personnel only.

The following chart is designed to diagnose and provide remedies for some of the troubles that may develop in this control unit.

It is assumed that proper installation has been made, according to Section 2 of this manual, and that the control unit has been functioning properly until this trouble developed.

Use this chart in conjunction with the circuit diagram while performing torubleshooting procedures. If the trouble is not remedied after performing these procedures, the nearest Factory Authroized Service Station should be contacted. In all cases of equipment malfunction, the manufacturer's recommendations should be strictly followed.

TROUBLE	PROBABLE CAUSE	REMEDY
Gas (and water) valve will not operate.	Plug(s) not secure in receptacle(s).	Ensure that plugs are secure in receptacle(s).
Control/feeder energizes but will not feed wire.	Switch control plug loose or a loose lead in the switch control plug.	Secure switch control plug in receptacle on control unit.
		Secure loose lead in switch control plug.
Electrode wire feeds but is not electrically hot. Gas (and water) valve operates.	Plug from welding machines contactor control receptacle loose or loose lead(s) in the plug or receptacle.	Secure plug in receptacle at control unit and welding machine.
		Ensure the leads inside of receptacle and plug are secured to their respective terminals.
Wire feeds when in CONTINUOUS position but not in SPOT.	Component defective in printed circuit board in control unit.	Replace printed circuit board.
	SPOT-CONTINUOUS switch (S51) improperly wired.	Check wiring of switch (S51).



Circuit Diagram No. CB-058 166-1A1

Figure 5-1. Circuit Diagram

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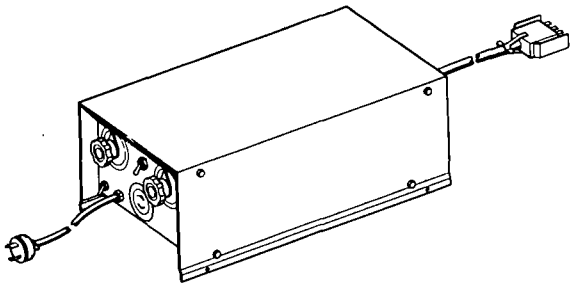

MODEL/STOCK NO.	SERIAL/STYLE NO.	DATE PURCHASED

PARTS LIST

millerMatic®

MILLER ELECTRIC MFG. CO.
APPLETON, WISCONSIN, USA 54911

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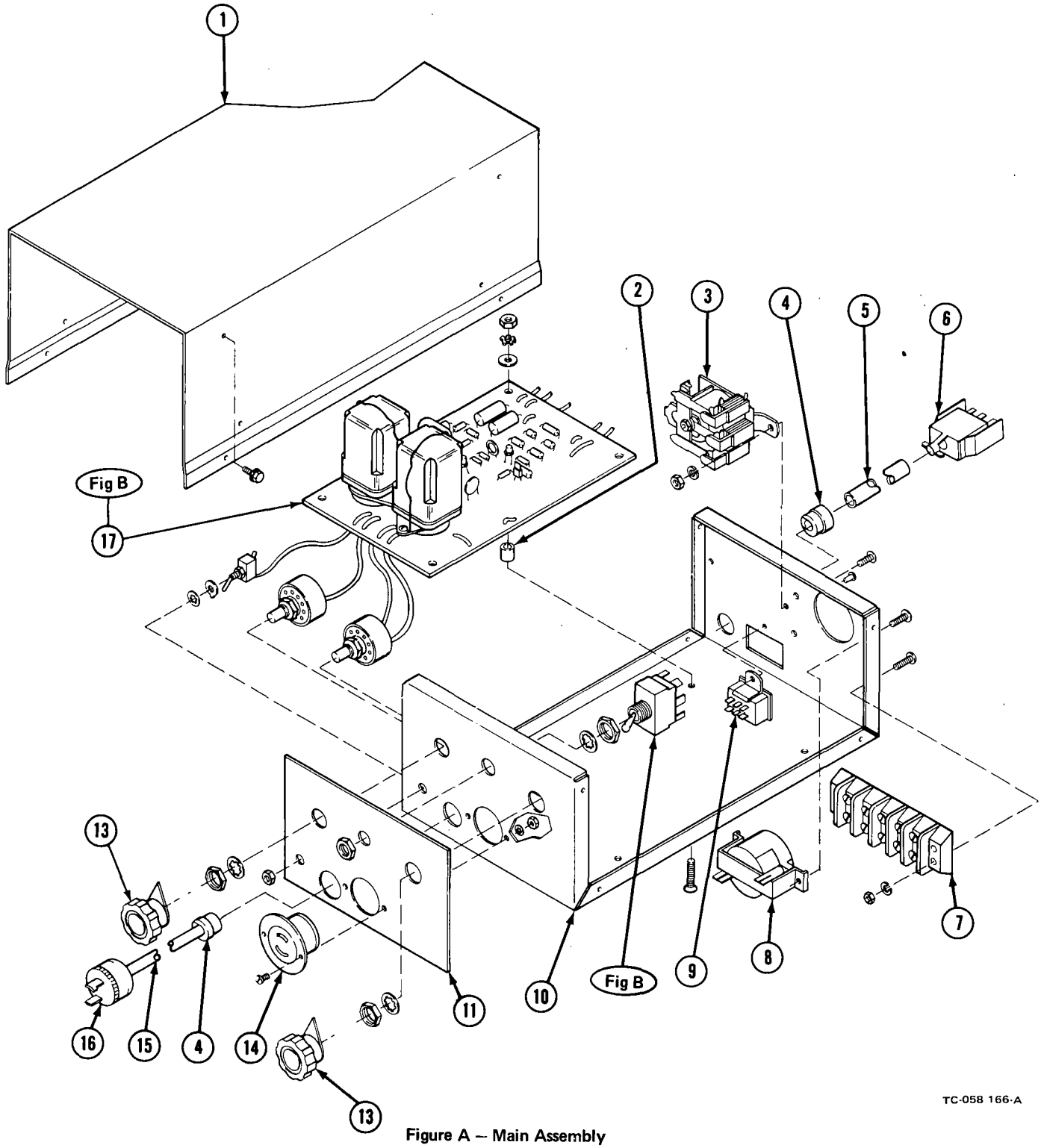

Figure A – Main Assembly

Item No.	Dia. Mkgs.	Factory Part No.	Description	Quantity
Figure A			**Main Assembly**	
1		025 289	WRAPPER (**attaching hardware A)	1
2		073 756	STAND-OFF 6-32 x 5/8 (**attaching hardware C)	4
3	CR53	034 666	RELAY, 24 volts ac 3PDT (**attaching hardware B, F & H)	1
4		010 476	BUSHING, strain relief 5/8 x .570 hole	2
5		028 493	TUBING, plastic 5/16 dia x 12 inches long	1
6	PLG54	056 265	CONNECTOR, male 6 contact	1
7		038 839	BLOCK, terminal 20 amp 5 pole (**attaching hardware D, F & H)	1
8	RC53	039 855	RECEPTACLE, twistlock 2P2W (**attaching hardware B)	1
9	RC54	056 266	CONNECTOR, female 6 contact (**attaching hardware B, F & H)	1
10		027 128	CASE SECTION, base/front/rear	1
11			NAMEPLATE (order by stock, model, & serial numbers)	1
13		024 366	KNOB, pointer	2
14	RC52	039 759	RECEPTACLE, female - flange midget twistlock 2P2W (**attaching hardware B, G & H)	1
15		028 491	CORD, SV 18 ga 2 conductor 29 inches with terminal	1
16	PLG52	039 830	CAP, polarized - twistlock 2P2W	1
17		058 704	CIRCUIT CARD ASS'Y, with switch (See Fig. B Page 3)(**attaching hardware B, E & G)	1
			****Attaching Hardware**	
A		604 804	SCREW, sheet metal - hex wing hd No. 8 x 3/8	
B		602 070	SCREW, machine - steel truss hd 6-32 x 3/8	
C		602 069	SCREW, machine - steel flat hd 6-32 x 3/8	
D		602 072	SCREW, machine - steel truss hd 6-32 x 5/8	
E		603 586	WASHER, flat - steel SAE No. 6	
F		602 198	WASHER, lock - steel split No. 6	
G		602 199	WASHER, lock - steel external tooth No. 6	
H		601 859	NUT, steel - hex 6-32	

BE SURE TO PROVIDE STOCK, MODEL, AND SERIAL NUMBERS WHEN ORDERING REPLACEMENT PARTS.

CERTAIN NON CRITICAL PARTS LISTED BELOW MAY DIFFER FROM THOSE USED ON THE CIRCUIT CARD IN YOUR UNIT, BUT WILL SERVE AS SUITABLE REPLACEMENTS.

Dia. Mkgs.	Factory Part No.	Description	Quantity
Figure B	**058 704**	**Circuit Card Assembly, With Switch (See Fig. A Page 2 Item 17)**	
S51	011 611	SWITCH, toggle DPDT 15 amp 125 volts	1
	**058 738	CIRCUIT CARD ASSEMBLY (consisting of)	1
C51,56	031 633	. CAPACITOR, electrolytic 80 uf 25 volts dc	2
C52,53	031 643	. CAPACITOR, ceramic 0.01 uf 500 volts dc	2
C54	032 943	. CAPACITOR, tantalum 4.7 uf 35 volts dc	1
C54	032 820	. CAPACITOR, electrolylic 2.2 uf 35 volts dc	1
C55	032 943	. CAPACITOR, tantalum 4.7 uf 35 volts dc	1
CR51	032 944	. RELAY, 12 volts dc DPDT	1
CR52	032 945	. RELAY, 24 volts dc DPDT	1
	032 946	. SOCKET, relay	2
D51-54	026 202	. DIODE, 1 ampere 400 volts straight polarity	4
D55	037 243	. DIODE, zener 18 volts 1 watt	1
Q51,52	022 135	. THYRISTOR, 4 amp 200 volts	2
Q53,54	037 289	. TRANSISTOR, unijunction 50MA 35 volts	2
R51	030 055	. RESISTOR, carbon 2 watt 10 ohm	1
R52,54,65	030 024	. RESISTOR, carbon 0.5 watt 1000 ohm	3
R53	030 630	. RESISTOR, WW fixed 11 watt 100 ohm	1
R55,57	030 937	. RESISTOR, carbon 0.5 watt 10 ohm	2
R56	030 709	. RESISTOR, carbon 1 watt 150 ohm	1
R58	030 004	. RESISTOR, carbon 0.5 watt 10K ohm	1
R59	030 738	. POTENTIOMETER, carbon 1 turn 2 watt 500K ohm	1
R60	030 145	. POTENTIOMETER, carbon 1 turn 0.25 watt 2000 ohm	1
R61,64	030 025	. RESISTOR, carbon 0.5 watt 100 ohm	2
R62	030 131	. POTENTIOMETER, carbon 1 turn 2 watt 50K ohm	1
R63	030 853	. RESISTOR, carbon 0.5 watt 2200 ohm	1
R66	030 024	. RESISTOR, carbon 0.5 watt 1000 ohm	1
R67,68	030 025	. RESISTOR, carbon 0.5 watt 100 ohm	2
R69	032 819	. RESISTOR, carbon 0.5 watt 390K ohm	1
S52	011 770	. SWITCH, toggle SPDT 5 amp 125 volts	1

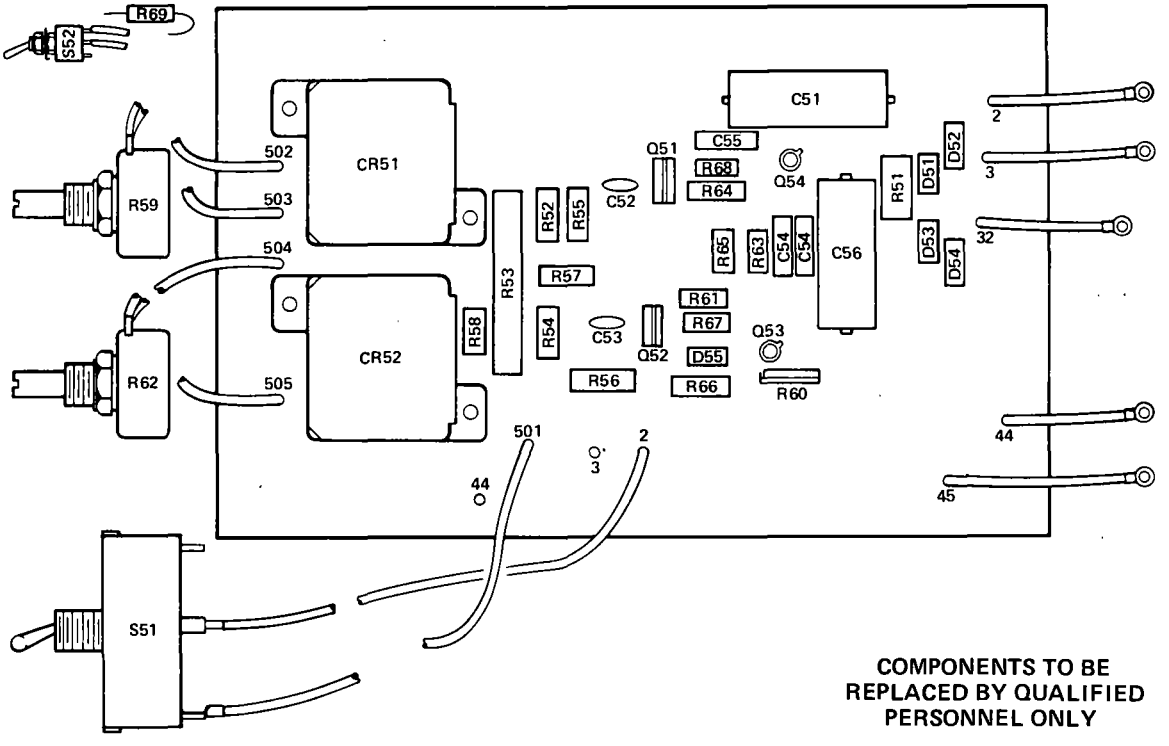

Figure B — Circuit Card Assembly, With Switch

TA-058 704

**Circuit Card Assembly is available on an exchange basis. Contact Factory Service Department for details.
BE SURE TO PROVIDE STOCK, MODEL, AND SERIAL NUMBERS WHEN ORDERING REPLACEMENT PARTS.